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HUNGARY PRODUCES NEW BUS, TRUCK CHASSIS

The following are technical details of the Type 510 Ikarusz 60 bus: The engine is designated as Type 613. It is a water-cooled, four-cycle, six-cylinder diesel engine utilizing elements of the four-cylinder diesel used in the Csepel auto. The latter engine serves as the basis of the Hungarian automotive manufacturing industry.

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The engine of the Ikarusz 60 has a 110-millimeter bore; stroke, 140 mm; displacement, 7.98 liters; compression ratio, 21:1; maximum output, 125 horsepower at 2,200 revolutions per minute; and greatest rotational force, 48.7 meter-kilograms. Lubrication occurs under pressure developed by a cog-wheel pump. The oil capacity of the crankcase is 24 liters. The cast-iron cylinders are damp-type, and the light-metal pistons are equipped with four feeding and two oil-wiping rings. Each cylinder head is a separate casting, equipped with one intake and one exhaust port. Cooling is effected by a pump-operated, forced-circulation system. The electrical system has a 300-watt generator, a 6-horsepower, 24-volt starter motor, and two 12-volt, 150 ampere-hour batteries. The fuel-oil tank has a capacity of 170 liters.

The engine has three-point suspension, resting on a detachable cradle, which in turn rests on the chassis. For servicing, the engine may be entirely removed by disconnecting the transmission and the fuel line, rolling the engine forward, and detaching the cradle.

The dry-type clutch has a single plate and a central spring. The clutch and the engine block are not a single unit. The clutch is separate from the engine, has a three-point rubber suspension, and may be easily removed either upward or downward. The remote-controlled transmission has five speeds forward and one reverse. The three high gears consist of constant-mesh gears of the synchronized type. The constant-mesh gears of second gear have claw-shaped engagers [gear-sliding forks 2]. First forward and reverse speeds are engaged by sliding gears.

The gear ratios are (1) 1:7.22, (2) 1:4.04; (3) 1:2.36, (4) 1:1.44; (5) 1:1; and reverse, 1:7.22. The transmission ratio of the rear bridge is 1:8.36.

The design of the rear bridge and the simple execution and securing of the axle housing permit moving the rear axles outward. This disconnects the rear wheels from the driving gears and permits the bus to be towed in case of damage.

The front axle is the forged, solid type and has a knuckle head. The front wheels are set in two removable, tapered roller-bearing cones. The wheels are mounted on semielliptic sheaf springs which are fixed in front and shackled in the rear. Spring action is damped by a bidirectional oil shock absorber on each spring.

The rear bridge is also the forged, solid type. The differential drive is housed in a separate, removable cast housing. The rear bridge is equipped with a differential lock operated from the driver's seat. The execution of the rear bridge is particularly advantageous from the viewpoint of strength since the bending force exerted by the weight of the bus is borne by the forged rear bridge. The torque from the drive line is exerted only on the rear-axle shafts and does not affect the rear bridge. In the customary execution, the rear bridge is subjected to both these effects.

The rear springs are semielliptical sheaf springs; the forward eyes are fixed, pushing eyes, and the rear eyes rest on sliding plates. The sheaf springs produce a light reaction to a light load and a strong reaction to a heavy load.

The tires are size 11 inches by 20 inches, the wheels (rims) 7.33 V by 20 inches. Tire inflation pressure at 2,100 kilograms wheel load is five atmospheres.

The braking system of the Ikarusz 60 was designed with great care and deserves special attention. The chassis has three independently operating brakes. The main brake is the foot-operated air brake, which is connected with a two-cylinder air compressor installed on the engine. Each wheel has an air

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cylinder, acting directly on a lever which is attached to the axle of the brake key drum?. The brakes may be applied when the vehicle is standing by applying pressure in the cylinders. Air does not leave the cylinder when the brake pedal is released and the brake holds. If air-reservoir pressure drops too low, the driver is notified by optical or acoustic signals.

The hand brake works on the rear wheels by means of rods. Dead action of the brake, due to wearing of the brake lining, is eliminated automatically by a latch apparatus.

Vehicles used on mountainous roads are equipped with a special exhaust-pipe engine brake. The exhaust pipe may be closed by a sliding lock, and the vehicle is effectively braked by motor compression. This provides added safety on long downgrades and means a saving in lessened wear on brake shoes.

Between the clutch and the gear box is a short Cardan drive shaft, equipped with a mechanic's joint. Between the gear box and the rear bridge is a jointed, dynamically balanced, centrally distributed Cardan propeller shaft. It is secured to the chassis. The intermediary double Cardan-jointed bushing is set in rubber.

The longitudinal members of the massive chassis are sheet-stamped, the partially sheet-stamped cross-members are riveted, and the body-supporting cross members are the high torsion-resistant console-tubular type.

The steering apparatus is on the left side of the bus, has globoid planetary gears, and is self-aligning. The steering ratio is 1:29 and the diameter of turn, measured on the front wheel, is 16 meters.

Basic units of the bus are also used in the chassis of the 5-ton truck. The driving apparatus has been designed to permit attaining the highest speed. By the use of three kinds of cone wheels (bevel gears) and two kinds of crown wheels as transmission in the differential?, the speed can be increased from 51 kilometers per hour to 70 kilometers per hour in steps of 5 kilometers per hour. The greatest speed at which the 12 x 20 sic tires may be used is 75 kilometers per hour.

Dimensions and output data are as follows: wheelbase, 5,000 millimeters; over-all length of chassis, 9,050 millimeters; track front, 1,855 millimeters; track rear, 1,815 millimeters; road clearance underneath front axle, 315 millimeters; road clearance underneath rear axle, 247 millimeters; turning diameter measured on front wheels, 16 meters; weight of chassis, 4,700 kilograms; weight of chassis with body, 7,500 kilograms; load (65 persons at 75 kilograms each), 4,900 kilograms; weight of loaded vehicle, 12,400 kilograms; greatest speed at highest engine turnover, first gear, 7.15 kilometers per hour; second gear, 12.8 kilometers per hour; third gear, 21.9 kilometers per hour; fourth gear, 35.9 kilometers per hour; fifth gear, 51.7 kilometers per hour; reverse gear, 7.15 kilometers per hour; maximum incline, full, 12,400 kilograms load, 28 degrees; and empty, 32 degrees.

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